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(54) Method and system for multimedia messaging service (MMS) rating and billing

(57) The advances disclosed herewith delimit an improved method and system for rating and billing Multimedia Messaging Service (MMS). Implemented as part of a computer program product represents a comprehensive real-time solution for rating incoming and outgoing MMS messages which enables wireless/mobile subscribers to maintain a single account for messaging (MMS) services.

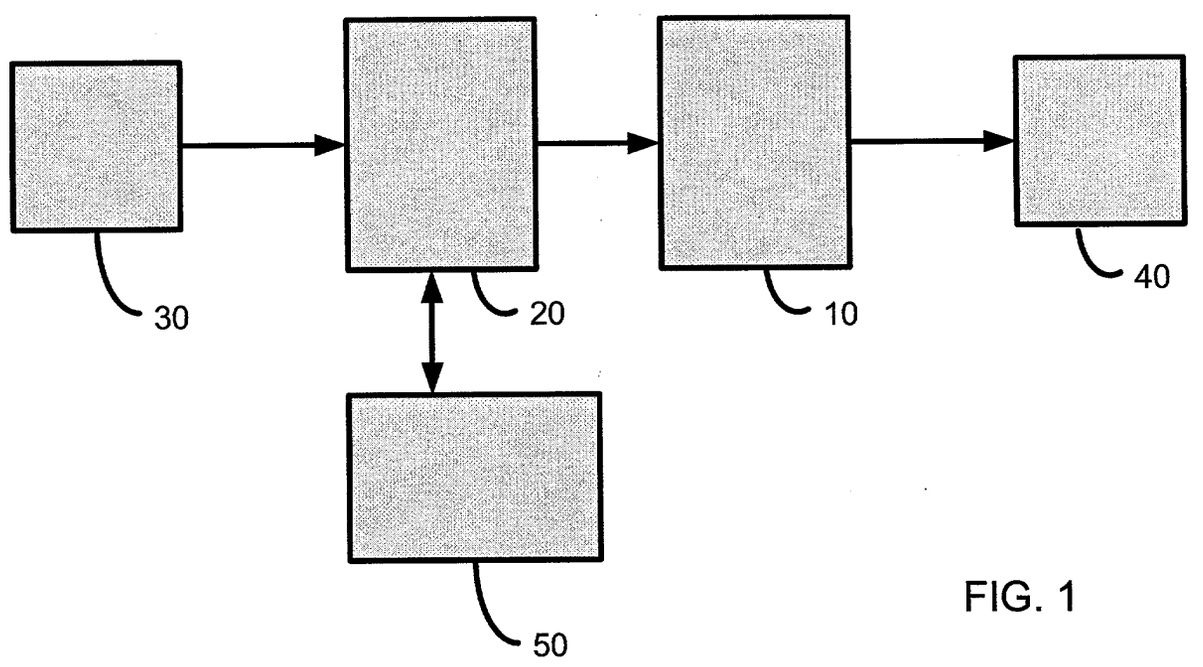


FIG. 1

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Description

[0001] The improved method and system for Multimedia Messaging Service (MMS) rating and billing disclosed herewith offers members skilled in the art of telecommunication network operation and intermediation an innovative mechanism for real-time rating and charging for MMS messages. (Both Mobile Originated (MO) and Mobile Terminated (MT) messages are encompassed by elements of the application).

[0002] With reference now to FIG. 1, the improved method and system for Multimedia Messaging Service (MMS) rating and billing 20 in particular is juxtaposed and remains contingent upon, in the preferred embodiment, an Open Charging (OC) middleware platform and gateway system 10 as detailed in Patent Application 10/307335, for mediation with a prepaid or postpaid platform. Noble technicians skilled in the art will recognize that the invention of present need not be limited to the aforementioned Open Charging (OC) middleware platform and gateway system and other similar network implementations may be employed without diluting the intent and scope as such. However, to facilitate ease of instruction and overall efficacy of purpose the recourse to the Open Charging (OC) middleware platform and gateway system 10 is expressly invoked and relied upon.

[0003] Furthermore, to facilitate the instruction of the art, the improved method and system for Multimedia Messaging Service (MMS) rating and billing 20 disclosed herewith interfaces with the Multimedia Messaging Service Center's (MMSC) 30 Real Time Payment Protocol (RTPP) interface for real-time Mobile Originated MMS rating and charging. The invention 20, which is articulated as part of computer program product, accepts RTPP triggers from a MMSC 30 and subsequently rates, and charges messaging traffic against the Open Charging (OC) middleware platform and gateway system 10. Technicians skilled in the art will recognize that the invention of present need not be limited to the aforementioned Open Charging (OC) middleware platform and gateway system and other similar network implementations may be employed without diluting the intent and scope as such. Technicians skilled in the art will also recognize that any number of protocols, triggers and interfaces may be employed herewith, and indeed, remain only bound by the state of the art and the reference to any one protocol (or similar rules, methods and means for the transmission of data) remains purely for the purposes of simplicity and ease of instruction, and do not serve to dilute the application and scope of the invention as such.

[0004] In alternate embodiments, the invention 20, may also access an external Lightweight Directory Access Protocol (LDAP) subscriber database 50 for subscriber profile queries. Technicians skilled in the art will also recognize that the triggers, protocols and like commands used among the network elements remain only bound by the state of the art and do not serve to dilute the generality of such interaction.

[0005] The MMSC 30 initiates connections to the improved method and system for Multimedia Messaging Service (MMS) rating and billing 20; and therewith once the connection has been established, the MMSC 30 performs transactions by submitting requests to the requisite logic of the disclosed invention 30.

[0006] In the preferred embodiment, the computer program product which implements the invention 20 disclosed herewith has been articulated with particular 'fail-safe' logic. Indeed, wherever the improved method and system for Multimedia Messaging Service (MMS) rating and billing 20 is invoked it attempts to connect to the external LDAP subscriber database 50. In the event the connection is lost, the node implementing the invention 20 will reattempt the connection at periodic intervals for a configurable number of times. Where re-connection remains unrealized, the improved method and system for Multimedia Messaging Service (MMS) rating and billing 20 will instinctively switch to one of the following configurable modes. In "reject" mode, all incoming RTPP triggers will be rejected immediately until connection is re-established. Connection attempts are performed at periodic intervals. In "passthrough" mode, all incoming RTPP triggers will be successfully acknowledged immediately until connection is re-established. Connection attempts are performed at periodic intervals. When a connection is broken, an SNMP trap will be raised. Once the connection is re-established, another SNMP trap is generated to clear the alarm.

[0007] At the core of the invention 20 remains the rating engine and the logic, routines and rules used therewith, articulated to provide real-time, high performance rating for MMS messages. The Rating Rule definition allows a member skilled in the art to determine the rate for each MMS. In the preferred embodiment, rules are to be considered in order. The first rule that matches a given MMS Event will be used and remaining rules will be ignored. Where no rules match, the MMS will be assumed to be free of charge. No charging will occur.

[0008] The member skilled in the art may insert, change and delete rules as they deem appropriate. For ease of reference, the following table (Table 1) seeks to outline the rating rule architecture in a non-limiting, illustrative manner.

Table 1

Rating Rule Architecture	
Title	**Description**
Rule #	The Rule #. Rules are processed in this order, starting from 1 increasing to DEF.

Table 1 (continued)

Rating Rule Architecture	
Title	**Description**
SPID	The Service Provider this rule belongs to. Required for MSP compliance
Originating Rate Plan	The Rate Plan of the Originating subscriber.
Originating MSISDN	The source address of the incoming message. Both exact matching and prefix matching supported.
Terminating Rate Plan	The Rate Plan of the Terminating subscriber
Terminating MSISDN	The destination address of the incoming message. Both exact matching and prefix matching supported.
Min Volume	The minimum volume, based on number of bytes, that the rule applies.
Max Volume	The maximum volume, based on number of bytes, that the rule applies. Use '*' to indicate no upper limit.
Day	The day that this rule applies. This can be one of: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, Weekdays (Mon-Fri), Weekends (Sat, Sun), Holidays (see Holiday table), Everyday (week)
Start Time	The Start Time, based on SMSC time, that the rule applies
End Time	The End Time, based on SMSC time, that the rule applies
Start Date	The date the rule is effective. The rule will be considered as effective on or following this day.
Orig Rate	The rate charged to the originating MSISDN.
Term Rate	The rate charged to the terminating MSISDN.

[0009] The invention 20 interfaces with an Open Charging (OC) middleware platform and gateway system 10 as detailed in Patent Application 10/307335, for mediation with the wireless subscriber's prepaid account in performing the requisite balance deduct function. Noble technicians skilled in the art will recognize that the invention of present need not be limited to the aforementioned Open Charging (OC) middleware platform and gateway system and other similar network implementations for balance deductions may be employed without diluting the intent and scope as such.

[0010] Additionally, when handling group messages, the invention 20 interfaces with an Open Charging (OC) middleware platform and gateway system 10 as detailed in Patent Application 10/307335, to query the balance of the wireless subscriber's prepaid account. Noble technicians skilled in the art will recognize that the invention of present need not be limited to the aforementioned Open Charging (OC) middleware platform and gateway system and other similar network implementations for balance queries may be employed without diluting the intent and scope as such.

[0011] Much like the 'fail-safe' scenario outlined prior (in regards to the external LDAP subscriber database 50), wherever the invention 20 is invoked the art therewith attempts to connect to the Open Charging (OC) middleware platform and gateway system 10. In the event the connection is lost, the node implementing the invention 20 will reattempt the connection at periodic intervals for a configurable number of times. Where re-connection remains unrealized, the improved method and system for Multimedia Messaging Service (MMS) rating and billing 20 will instinctively switch to one of the following configurable modes. In "reject" mode, all incoming RTPP triggers will be rejected immediately until connection is re-established. Connection attempts are performed at periodic intervals. In "passthrough" mode, all incoming RTPP triggers will be successfully acknowledged immediately until connection is re-established. Connection attempts are performed at periodic intervals. When a connection is broken, an SNMP trap will be raised. Once the connection is re-established, another SNMP trap is generated to clear the alarm. Technicians skilled in the art will recognize that the invention of present need not be limited to the aforementioned Open Charging (OC) middleware platform and gateway system and other similar network implementations for balance queries may be employed without diluting the intent and scope as such.

[0012] Another singular aspect of the invention of present, remains the ability to rate and charge for Group Messages. A Group Message is defined as an MMS message addressed to multiple recipients. In the all-or-none scenario, where the originating wireless subscriber does not have sufficient fund to send the MMS message to all the recipients, the whole Group Message Transfer is rejected and no MMS message is delivered to any of the recipients.

[0013] In elucidating further how the improved method and system for Multimedia Messaging Service (MMS) rating and billing handles Group Messages, the following steps should prove illustrative. In the first instance, determine if the incoming Debit Request received from the MMSC belongs to a Group Message by examining the MMSC_NUMBER_OF_RECIPIENTS field. Where the MMSC_NUMBER_OF_RECIPIENTS is greater than 1, the Debit Request is for Group Messaging. Next confirm if the Debit Request is for the first recipient by searching corresponding MMSC_A_MSISDN and MMSC_MSG_ID in the Group Message Store. The Group Message Store holds all outstanding Group Message information which includes, but need not be bounded by, MMSC_A_MSISDN, MMSC_MSG_ID, MMSC_NUMBER_OF_RECIPIENTS, number of processed recipients, each recipient's information (B-Party Address and Service Type), balance, total rate, SCP ID.

[0014] Where the Debit Request is for the first recipient, an LDAP subscriber query on A-Party will be performed and a new Group Message entry will be created in the Group Message Store. In addition, the logic of the invention can be articulated to perform a balance query to SCP 40 on the first recipient message, a BalQ will be triggered to the Open Charging (OC) middleware platform and gateway system and the subscriber balance will be returned. Otherwise, a configurable fixed balance will be used instead. Members skilled in the art will recognize that the invention of present need not be limited to the aforementioned Open Charging (OC) middleware platform and gateway system and other similar network implementations for balance queries may be employed without diluting the intent and scope as such.

[0015] Next, the art of the invention performs an LDAP subscriber query on B-Party address (if it is a National number), rates the message, and subtracts the amount from the balance. Next, an update is performed to the corresponding Group Message entry with the Total Rate and B-Party information. Where the Total Rate exceeds Balance, the invention clears the corresponding Group Message entry and sends a warning message (where configured by a member skilled in the art) to A-Party. Also, a Debit Response with status code 0x6000 (insufficient funds) will be sent back to MMSC via the original node. Credit Requests may then be triggered by the MMSC to refund a charge for each recipient and should all be positively acknowledged.

[0016] If the Debit Request is not for the last recipient and the Total Rate does not exceed Balance, the invention positively acknowledges the Debit Request to MMSC via the original node. Whereas, where the Debit Request is for the last recipient, another balance query is performed by triggering an Open Charging (OC) middleware platform and gateway system as detailed in Patent Application 10/307335, as to minimize the fault window. If the Total Rate exceeds the new Balance, a warning message (where configured by a member skilled in the art) is sent to A-Party and a Debit Response with status code 0x6000 (insufficient funds) will be sent back to MMSC via the original node. Otherwise, the logic of the invention positively acknowledges the Debit Request to MMSC via the original node and then performs a sequence of BalDeduct (for each recipient) to the Open Charging (OC) middleware platform and gateway system to debit the wireless subscriber. The corresponding Group Message entry is cleared afterwards.

[0017] The computer program product which implements the improved method and system for Multimedia Messaging Service (MMS) rating and billing, has been articulated as to store Group Message entries (then 'Group Message Store'), and will allow said messages to expire and eliminated after a configurable time period. This functionality and implementation is intended to deal with scenarios as MMSC node failures and related exceptions.

[0018] In alternate embodiments, the improved method and system for Multimedia Messaging Service (MMS) rating and billing may send a warning message to a prepaid wireless subscriber where said subscriber has an insufficient balance to send a Mobile Originated message. This applies to Single Recipient MMS messages (when debit fails) and Group Messages (when balance falls below 0 or debit fails). The content of the warning message remains entirely configurable (e.g. "Sorry you have insufficient funds. Please try again and thank you for playing"). The message is limited to a single SM.

Claims

1. An improved method for Multimedia Messaging Service (MMS) rating and billing.

2. The method of claim 1, whereby the invention interfaces with a Multimedia Messaging Service Center (MMSC) to permit real-time Mobile Originated (MO) MMS rating and charging before they are submitted to the relevant Service Control Point (SCP) as the per the ordinary routing of telecommunications in a GSM network.

3. The method of claim 2, whereby the invention disclosed makes a request to an Open Charging (OC) middleware platform and gateway system or similar type of method, system and/or apparatus designed to ensure prepaid subscribers have sufficient funds in their account which duly entitles them to the requested Multimedia Messaging Service(s).

4. The method of claim 1, whereby an improved and integrated series of rules are invoked and designed to sort,

classify and/or rate MMS traffic.

5. The method of claim 4, where said rules are implemented as part of a computer program product, comprising:

a) a computer readable memory medium; and
b) a computer program including the logic required to implement the rules as such.

6. The method of claim 5, wherein such rules remain highly configurable and flexible given the dependencies and requirements in determining the MMS tariff for a given subscriber.

7. The method of claim 6, where such rules may include messaging type, origination/termination type, on/off-Net differentiation, content, size, quantity, duration, time of day/buckets/free transactions, configured promotions, *inter alia.*

8. The method of claims 3 and 4, whereby the given MMS traffic is rated accordingly as against the subscriber balance.

9. An improved method for Group Multimedia Messaging Service (MMS) rating and billing.

10. The method claim 9, where Group Multimedia Messaging Service is defined as an MMS messages addressed to multiple recipients.

11. The method of claim 9, wherein in the logic of the invention determines the MMS delivery to be a Group Message by examining the number of recipients thereof.

12. The method of claim 9, whereby the invention interfaces with a Multimedia Messaging Service Center (MMSC) to permit real-time Mobile Originated (MO) MMS rating and charging before they are submitted to the relevant Service Control Point (SCP) as the per the ordinary routing of telecommunications in a GSM network.

13. The method of claim 12, whereby the invention disclosed makes a request to an Open Charging (OC) middleware platform and gateway system or similar type of method, system and/or apparatus designed to ensure prepaid subscribers have sufficient funds in their account to facilitate the requested Group Multimedia Messaging Service.

14. The method of claim 9, whereby an improved and integrated series of rules are invoked and designed to sort, classify and/or rate MMS traffic.

15. The method of claim 14, where said rules are implemented as part of a computer program product, comprising:

a) a computer readable memory medium; and
b) a computer program including the logic required to implement the rules as such.

16. The method of claim 15, wherein such rules remain highly configurable and flexible given the dependencies and requirements in determining the MMS tariff for a given subscriber.

17. The method of claim 16, where such rules may include messaging type, origination/termination type, on/off-Net differentiation, content, size, quantity, duration, time of day/buckets/free transactions, configured promotions, *inter alia.*

18. The method of claims 13 and 14, whereby the given Group MMS traffic is rated accordingly as against the MO subscriber balance.

19. The method of claim 18, where given the rating criteria and initiating (MO) subscriber balance (and so forth) the Group MMS is either delivered or barred in an all-or-none fashion.

20. The method of claim 19, where either a positive or negative acknowledgment is accordingly returned to the initiating (MO) subscriber.

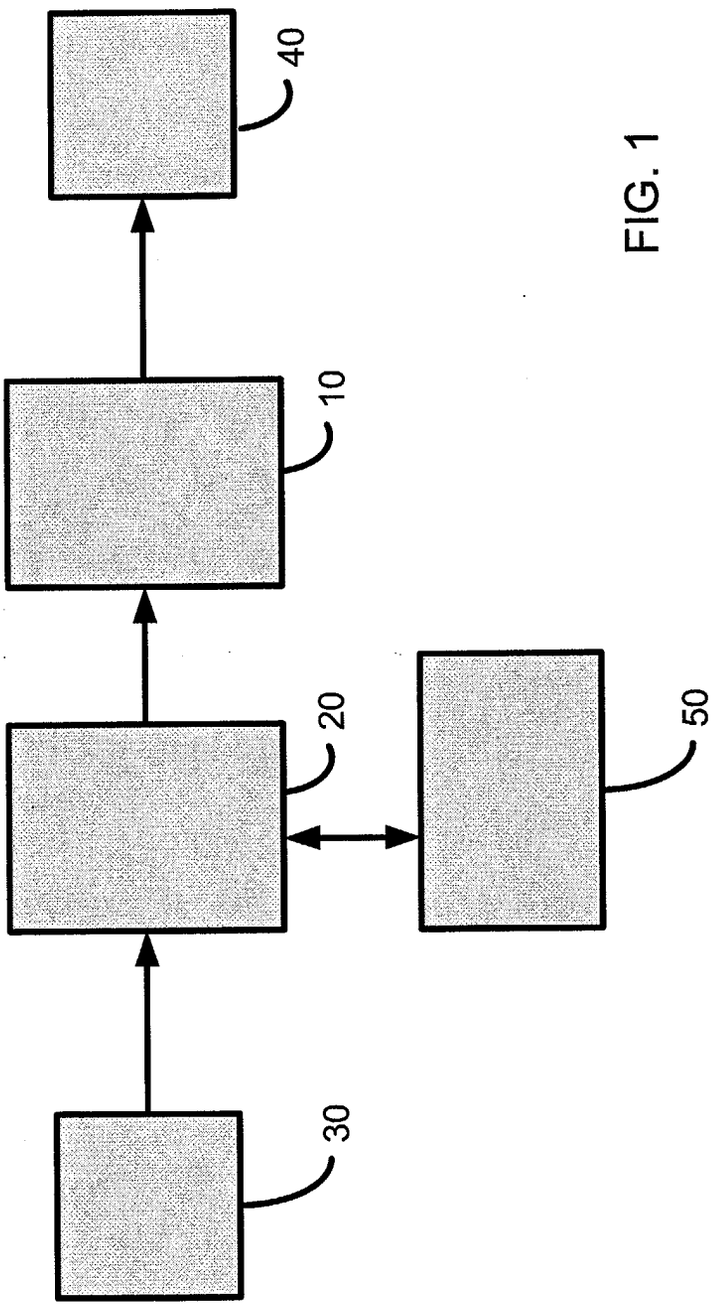


FIG. 1